Journal

of the

Optical Society of America

EDITOR-IN-CHIEF: PAUL D. FOOTE
GULF RESEARCH LABORATORY, 327 CRAFT AVENUE
PITTSBURGH, PA.

ASSISTANT EDITOR-IN-CHIEF AND BUSINESS MANAGER: F. K. RICHTMYER
CORNELL UNIVERSITY, ITHACA, N. Y.

CONSULTING BUSINESS MANAGER, M. E. LEEDS, PHILADELPHIA, PA.

Associate Editors

Term Ending Dec. 31, 1933	*Term Ending Dec. 31, 1935*	*Term Ending Dec. 31, 1937*
SAUL DUSHMAN	H. E. IVES	K. K. DARROW
K. S. GIBSON	R. A. MILLIKAN	I. C. GARDNER
L. O. GRONDAHL	A. H. PFUND	G. R. HARRISON
P. E. KLOPSTEG	C. SHEARD	L. A. JONES
W. B. RAYTON	L. W. TAYLOR	L. W. MCKEEHAN
H. B. WILLIAMS	H. S. UHLER	J. P. C. SOUTHALL

Volume 22, Numbers 1 to 12, 1932

OFFICE OF PUBLICATION
GEORGE BANTA PUBLISHING COMPANY
450–460 AHNAIP ST.
MENASHA, WISCONSIN

Optical Research Laboratory
QC
350
F17
v.22

TABLE OF CONTENTS

(VOLUME 22)

JANUARY

Proceedings of the Sixteenth Annual Meeting - - - - - - - - - - - - - 1
An Interferometer Method of Studying the Vibrations of an Oscillating Quartz Plate - —HAROLD OSTERBERG 19
Reviews - 36

FEBRUARY

The Problem of Motion Picture Projection from Continuously Moving Film - - - - - - - - - - - - - - - - —FORDYCE TUTTLE AND CHAS. D. REID 39
The "Depressed" Beam of the Motor Car Headlight - - - L. W. TAYLOR 65
Chromaticity Sensibility to Stimulus Differences - - - - - - DEANE B. JUDD 72
Reviews - 109

MARCH

Brock Process of Aerial Mapping - - - - - - - - - - EDWARD H. CAHILL 111
Aerial Stereo-Photographic Mapping Instruments and Methods - C. H. BIRDSEYE 137
An Apparatus for Motion Photomicrography on 35 mm Film - R. P. LOVELAND 161
On Temperature Crests in Cando-Luminescence - E. L. NICHOLS AND H. L. HOWES 170
Review - 190

APRIL

A Method of Projection in Relief and Color - - - - - - HERBERT E. IVES 191
Polychrome Photography - - - - - - - - - - - - - - FREDERICK E. IVES 199
Photographic Plates for Use in Spectroscopy and Astronomy. II - C. E. KENNETH MEES 204
A New Bench for Testing Photographic Lenses - - - - - - R. KINGSLAKE 207
Characteristics of Coiled Filaments in Incandescent Lamps - - - - - - - - - - - - - - - - - - - —GORTON R. FONDA AND ARTHUR A. VERNON 223
The Interpretation of Spectrograms - - - A. H. TAYLOR AND T. KNOWLES 229
Annual Report of Secretary O.S.A. for 1931 - - - - - - - - - - - - - 236
Note - 238

MAY

An Eclipse Projector for the Franklin Institute Museum - - JAMES STOKLEY 239
On the Concave Grating Spectrograph, Especially at Large Angles of Incidence - - - - - - - - - - - - J. E. MACK, J. R. STEHN, AND BENGT EDLÉN 245
Determination or the Spectral Composition of X-Ray Radiation from Filtration Data - - - - - - - - - - - - - - - - - - LUDWIK SILBERSTEIN 265
A Universal Spectrometer for the Infrared - - - - - - - - - A. H. PFUND 281
Anomalies of Visual Acuity in Relation to Stimulus-Distance - ELLIS FREEMAN 285
New Developments in Photoelasticity—A Purely Optical Method of Stress Analysis - ARSHAG G. SOLAKIAN 293
Review - 264

TABLE OF CONTENTS (Continued)

JUNE

Plane Waves of Light. III. Absorption by Metals – – – THORNTON C. FRY 307
Retinal Chromatic Fields as a Function of Wave Length – CHARLES A. RINDE 333
Relation between Certain Types of Luminescence – E. L. NICHOLS AND FRANCES G. WICK 357
Trichromatic Functions of the Average Eye – W. F. HAMILTON AND ELLIS FREEMAN 369
Reviews – 388

JULY

Lorentz Double Refraction in the Regular System – E. U. CONDON AND F. SEITZ 393
Intensity, Area, and Distance of Visual Stimulus – – – – ELLIS FREEMAN 402
On the Penetration of Daylight into the Sea – – – – – – – – E. O. HULBURT 408
Trichromatic Colorimeter – – – – – – – – – – – – – – – J. ZERNIKE 418
Cambridge Meeting of the Optical Society of America – – – – – – – – – – 422
Financial Statement J.O.S.A.-R.S.I. – – – – – – – – – – – – – – – – 435
Reviews – 436

AUGUST

On the Intensity of Illumination in Spectrographs – – – – O. OLDENBERG 441
Thermal Behavior of Certain Solid Solutions – E. L. NICHOLS AND MARY A. EWER 456
Review – 466

SEPTEMBER

Editorial: Retirement of Dr. Paul D. Foote as Editor-in-Chief – – – – – – – 467
The Sensitization of Ordinary Photographic Plates to Wave Lengths Below 2500A – – – – – – – – – – – – – – – – – A. J. ALLEN AND R. G. FRANKLIN 469
Limitations of a Blanket Calibration Chart for Reading Dispersions on the Abbe Refractometer – – – – – – – – – – – LAURENCE ELLSWORTH DODD 477
A Simplified Method of Preparing Schumann Plates – J. J. HOPFIELD AND E. T. S. APPLEYARD 488
The Use of Plant Transmission Gratings – – – – – – – – – H. M. REESE 496
Reviews – 499

OCTOBER

Irwin G. Priest – 503
Leonard Thompson Troland – – – – – – – – – – – – – – – – – – 509
Ultraviolet Transmission Coefficient of the Earth's Atmosphere – R. S. ROCKWOOD AND R. A. SAWYER 513
Effect of Intensity and Underlying Fogs on the Latent Image – – – – – – – – – – – – – – – – – FRANKLIN E. POINDEXTER AND LOUIS E. JAMES 525
Function of sin x/x – – – – – – – – – – – – – – – – – SIMON H. BAUER 537
Corresponding Retinal Points, the Horopter and Size and Shape of Ocular Images. Part I – – – A. AMES, JR., KENNETH N. OGLE AND GORDON H. GLIDDON 538

NOVEMBER

Corresponding Retinal Points, the Horopter and Size and Shape of Ocular Images. Part II – – A. AMES, JR., KENNETH N. OGLE AND GORDON H. GLIDDON 575
Relation Between the Composition and the Density and Optical Properties of Glass. I. The Soda-Lime-Silica Glasses – – G. W. MOREY AND H. E. MERWIN 632

TABLE OF CONTENTS (Continued)

DECEMBER

Adolph Lomb – 663
An Analytical Treatment of the Longitudinal Horopter; Its Measurement and Application to Related Phenomena, Especially to the Relative Size and Shape of the Ocular Images – – – – – – – – – – – – – KENNETH N. OGLE 665
Accommodation, Pupillary Width, and Stimulus Distance – – ELLIS FREEMAN 729
Modified Broca Pupillometer – – – – – – – – – – – – FRANK K. MOSS 735
Absorption and Dispersion of Celluloid between 300A and 1000A – H. M. O'BRYAN 739
Annual Report of Treasurer O.S.A. for 1931 – – – – – – – – – – – – – 749
Index to Volume 22 – 751

OFFICERS

OF THE

OPTICAL SOCIETY OF AMERICA

FOR THE YEAR 1932

President—E. C. CRITTENDEN
Bureau of Standards
Washington, D.C.

Vice-President—W. B. RAYTON
Bausch & Lomb Optical Co.
Rochester, N.Y.

Secretary—L. B. TUCKERMAN
Bureau of Standards
Washington, D.C.

Treasurer—ADOLPH LOMB
Rochester, N.Y.
(Deceased Sept. 30, 1932)
HENRY F. KURTZ
Bausch & Lomb Optical Co.
Rochester, N.Y.
(Appointed Oct. 18, 1932)

The Council consists of the above officers, the Editor-in-Chief of the JOURNAL, the past President, L. A. Jones, Eastman Kodak Company, Rochester, N.Y., and the following elected members: G. S. Fulcher, Administration Bldg., World's Fair, Chicago, Ill.: A. C. Hardy, Massachusetts Institute of Technology, Cambridge, Mass.; T. R. Wilkins, University of Rochester, Rochester, N.Y.; A. G. Worthing, University of Pittsburgh, Pittsburgh, Pa.

The object of the Optical Society of America is to serve the interests of all who are engaged in any branch of optics from fundamental research to the manufacture of optical goods.

The Constitution provides that anyone who has contributed materially to the advancement of optics shall be eligible to regular membership in the Society with the privilege of voting and holding office. Any individual or corporation interested in optics is eligible to associate membership.